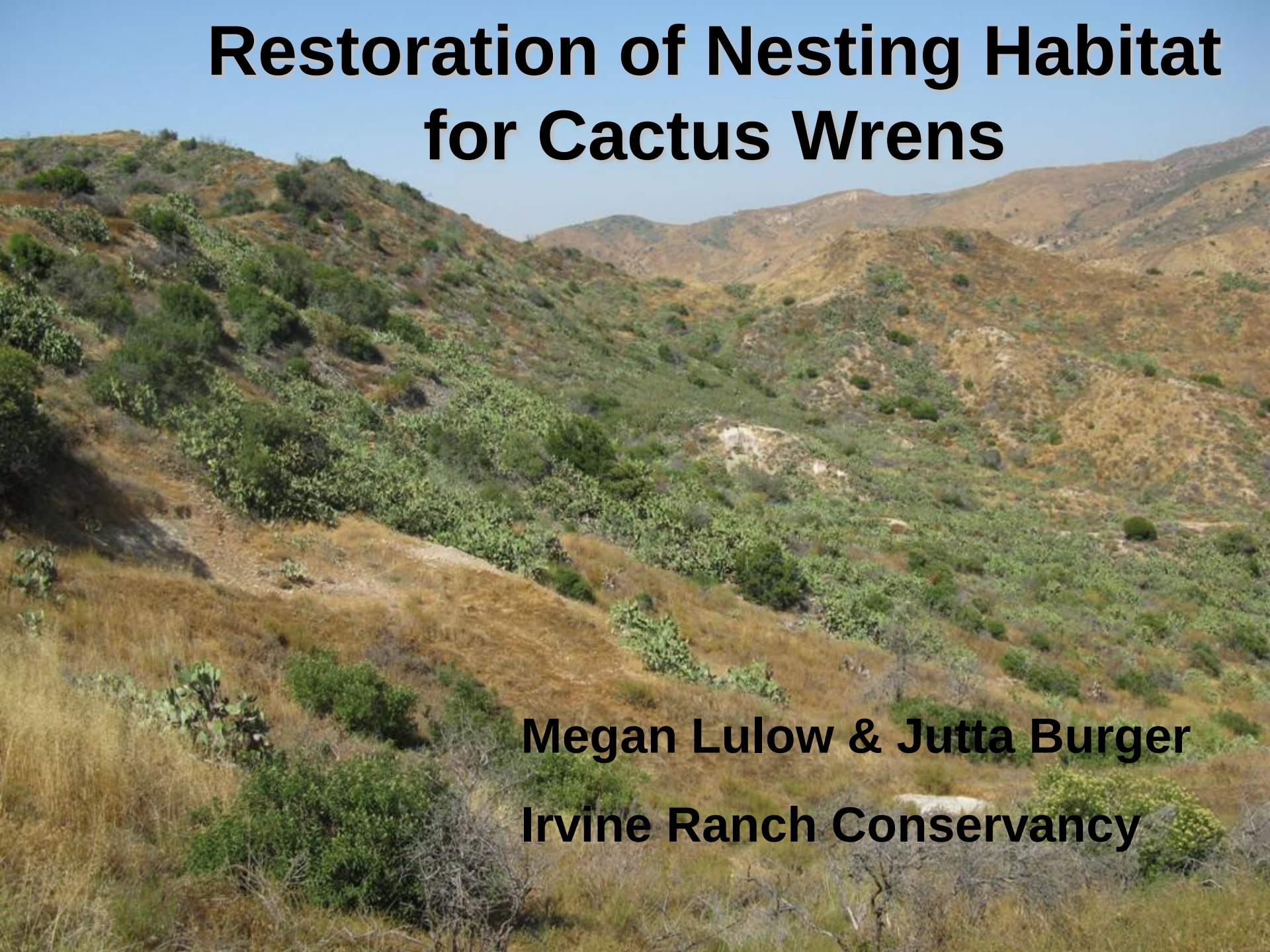
Restoration of Nesting Habitat for Cactus Wrens



Megan Lulow & Jutta Burger

Irvine Ranch Conservancy

Irvine Ranch Conservancy
Cactus Wren Projects

- Cactus restoration in Central Reserve/North Ranch (post-fire response)
- Artificial nest project: IRC, Robb Hamilton
- Cactus restoration pilot study testing weed control; IRC
- Cactus scrub restoration in Coastal Reserve (population linkage); NROC, New Fields (Griswold), IRC (2 sites)

Project Objectives

- Augment cactus scrub habitat burned in the 2007 Santiago Wildfire in areas that would *benefit existing cactus wrens most*
- Restoration approach that minimizes risk of cactus patch destruction during future wildfires
- Feasible restoration approach that balances benefits of abundant sites and rapid structure

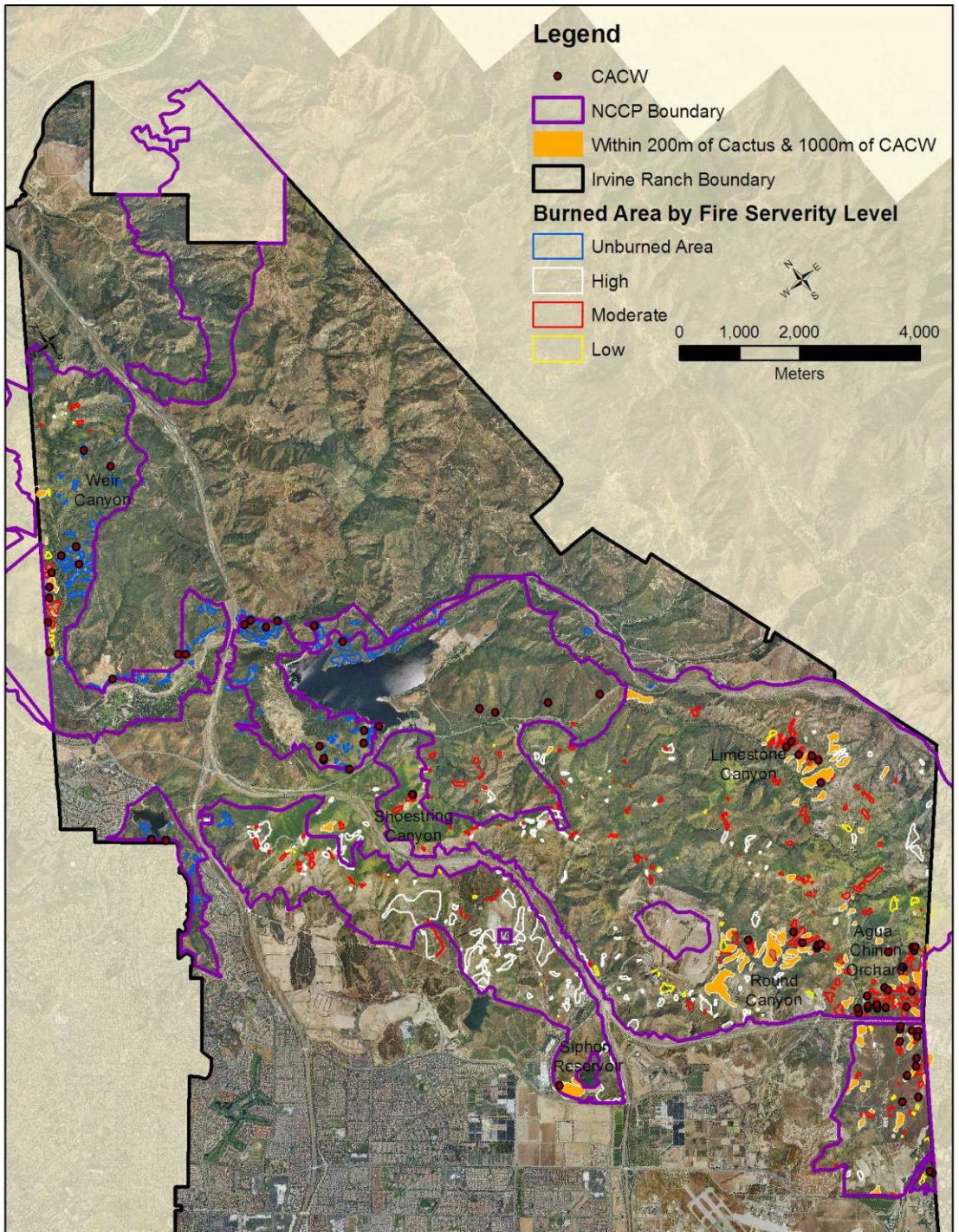
Coastal Cactus Wren Habitat

- Quality nesting habitat:
  - Coastal prickly pear (*Opuntia littoralis*) and coastal cholla (*Cylindropuntia prolifera*) >1m height
  - At least 2 ac cactus scrub with >20% cactus cover
  - Presence of *Sambucus mexicana*

Photo: Robb Hamilton

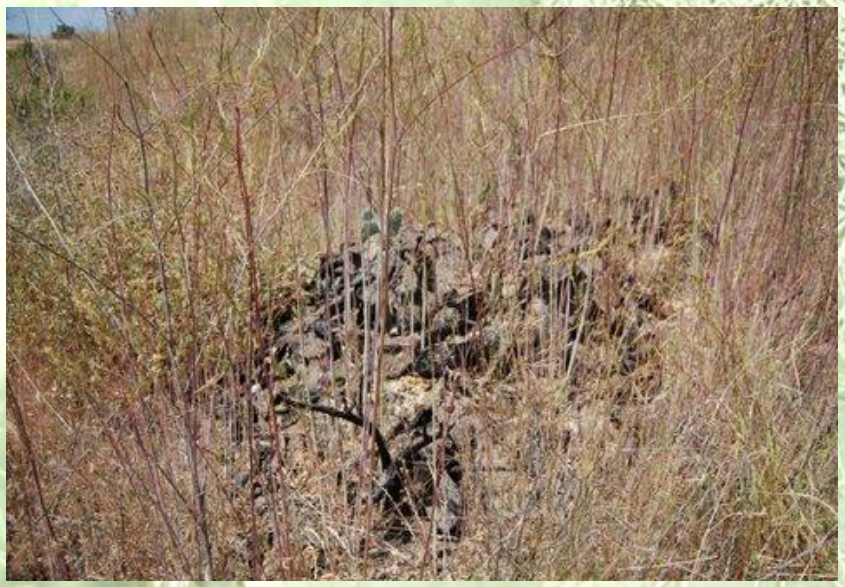
Criteria for Candidate Restoration Sites

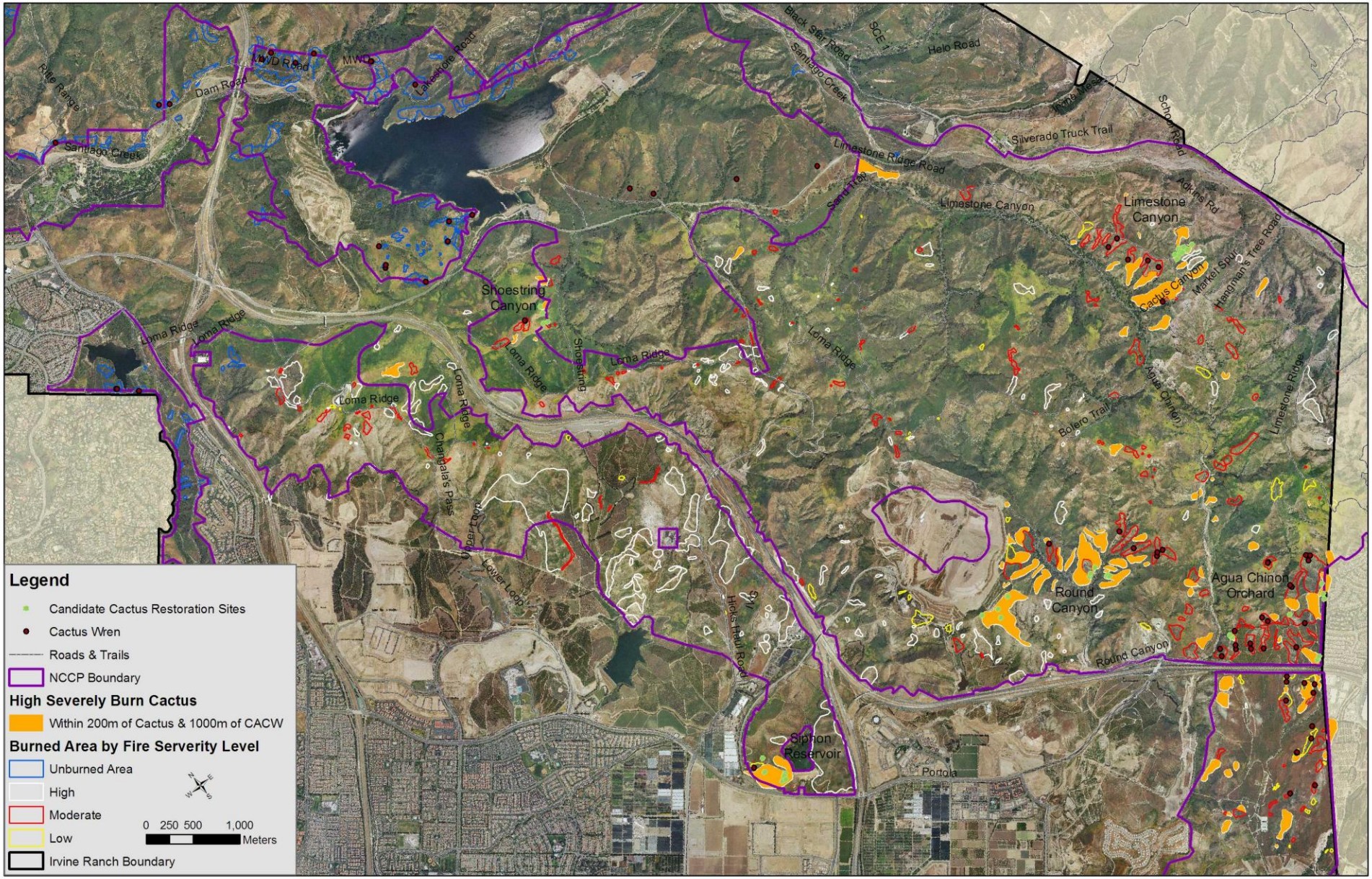
- Utilized 2008 Central Reserve Cactus Wren Habitat Assessment and Survey (NROC & Leatherman)
- For severely burned polygons:
  - Within 1000 m of 2008 cactus wren location
  - Within 200 m of cactus patch that was not severely burned

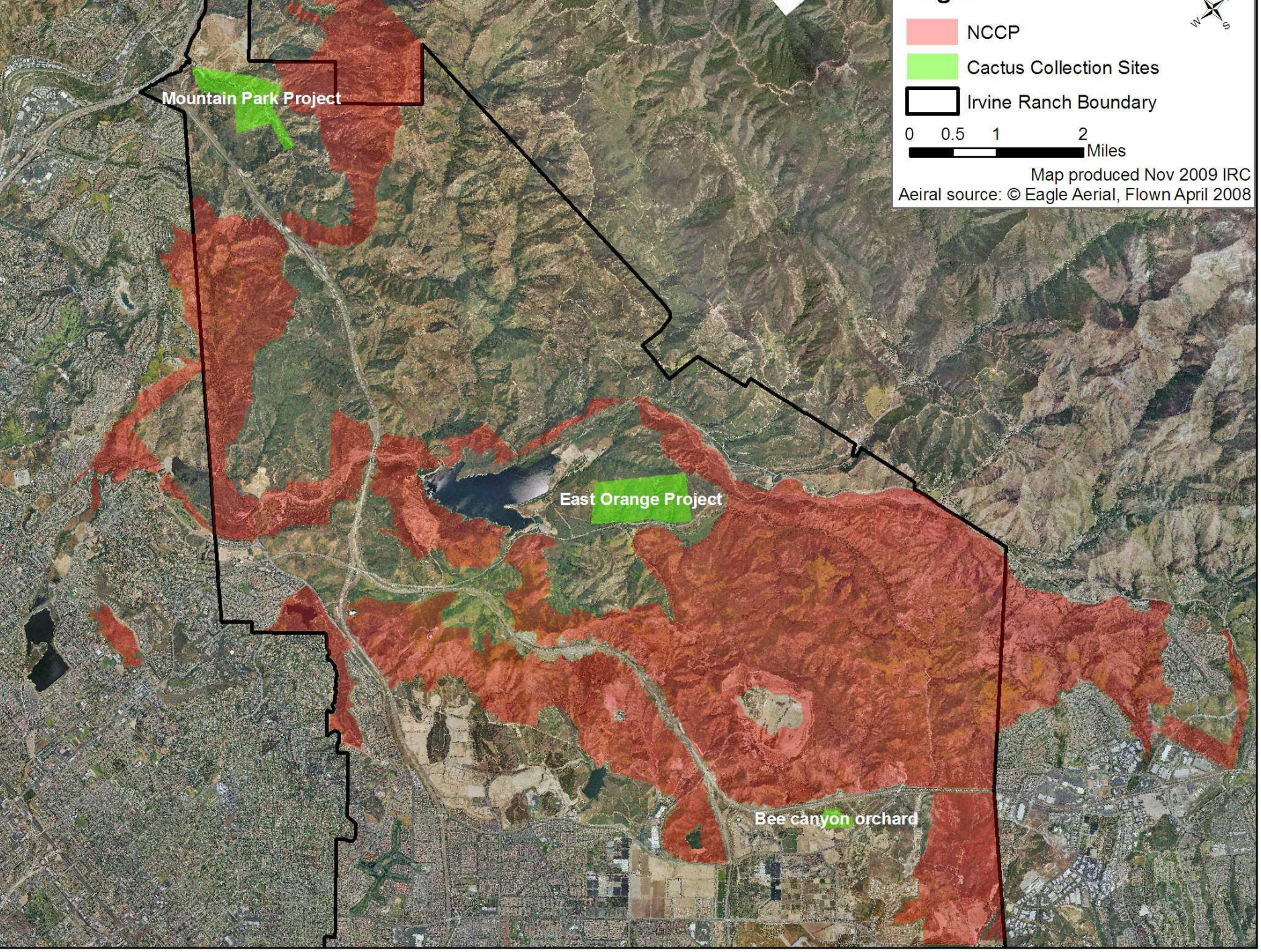


Ground Surveys of Candidate Polygons

- Would the patch make a significant contribution to cactus in the vicinity (not too much or too little)?
- Was there enough space between shrubs for a cactus patch?
- What was the extent of weeds?
- Updated (2009) presence of Cactus Wren within 1 km
- Location of rare or sensitive species



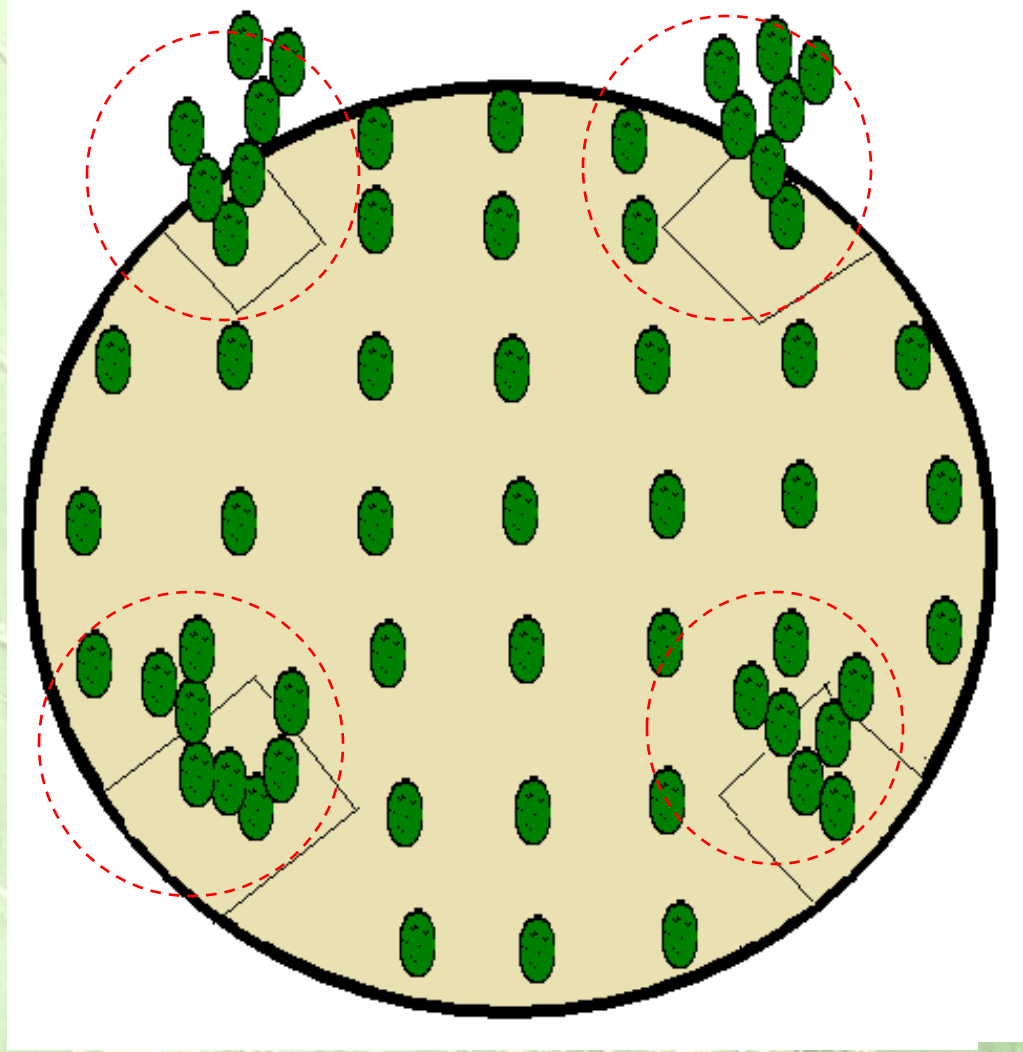

Legend
Candidate Cactus Restoration Sites
Cactus Wren
Roads & Trails
NCCP Boundary
High Severely Burn Cactus
Within 200m of Cactus & 1000m of CACW
Burned Area by Fire Serverity Level
Unburned Area
High
Moderate
Low
Irvine Ranch Boundary
0 250 500 1,000
Meters
Rifle Range
Santiago Creek
Dam Road
MWD Road
MWD
Limestone Road
Black Star Road
SCE-1
Helo Road
Santiago Creek
Point Mesa
School Road
Silverado Truck Trail
Limestone Ridge Road
Sand Trail
Limestone Canyon
Limestone Canyon
Adkins Rd
Cactus Canyon
Market Spur
Hangman's Tree Road
Shoestring Canyon
Loma Ridge
Loma Ridge
Loma Ridge
Loma Ridge
Loma Ridge
Loma Ridge
Loma Ridge
Loma Ridge
Shoestring
Agua Chinon
Bolero Trail
Limestone Ridge
Chandala's Pass
Lower Loop
Lower Loop
Hicks Haul Road
SR-241
Round Canyon
Agua Chinon Orchard
Round Canyon
Siphon Reservoir
Portola


Mountain Park Project
East Orange Project
Bee canyon orchard
NCCP
Cactus Collection Sites
Irvine Ranch Boundary
0 0.5 1 2
Miles
Map produced Nov 2009 IRC
Aeiral source: © Eagle Aerial, Flown April 2008

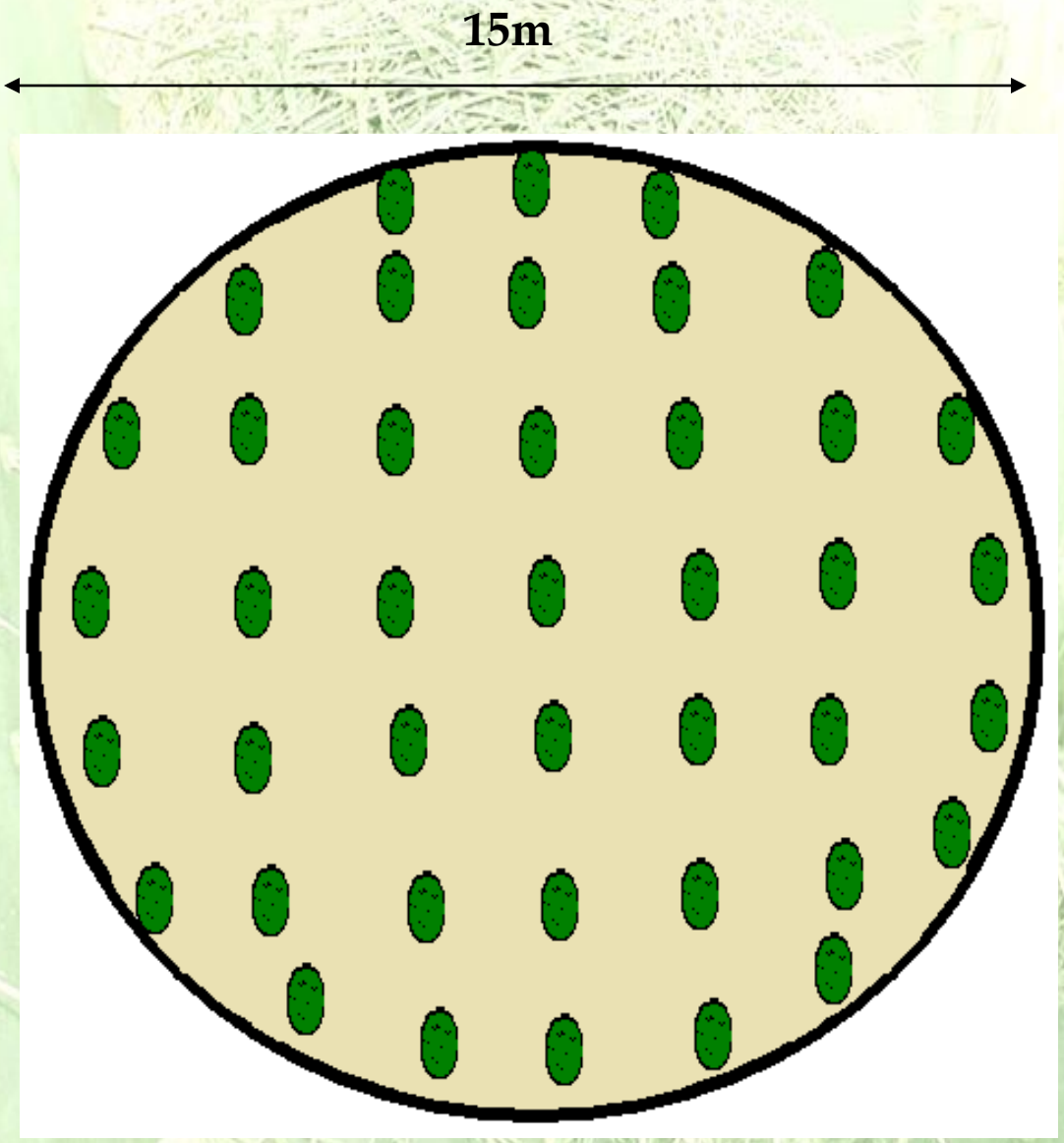
Design of Restored Cactus Patch

- 40 patches
- 15 m diameter patch
- ~2 pads/m^2 (350 pads/patch, 15,000 pads total)
- four, 3 yr old prickly pear transplants/patch (160 total)
- two, 7mo Mexican elderberry transplants/patch (80 total)

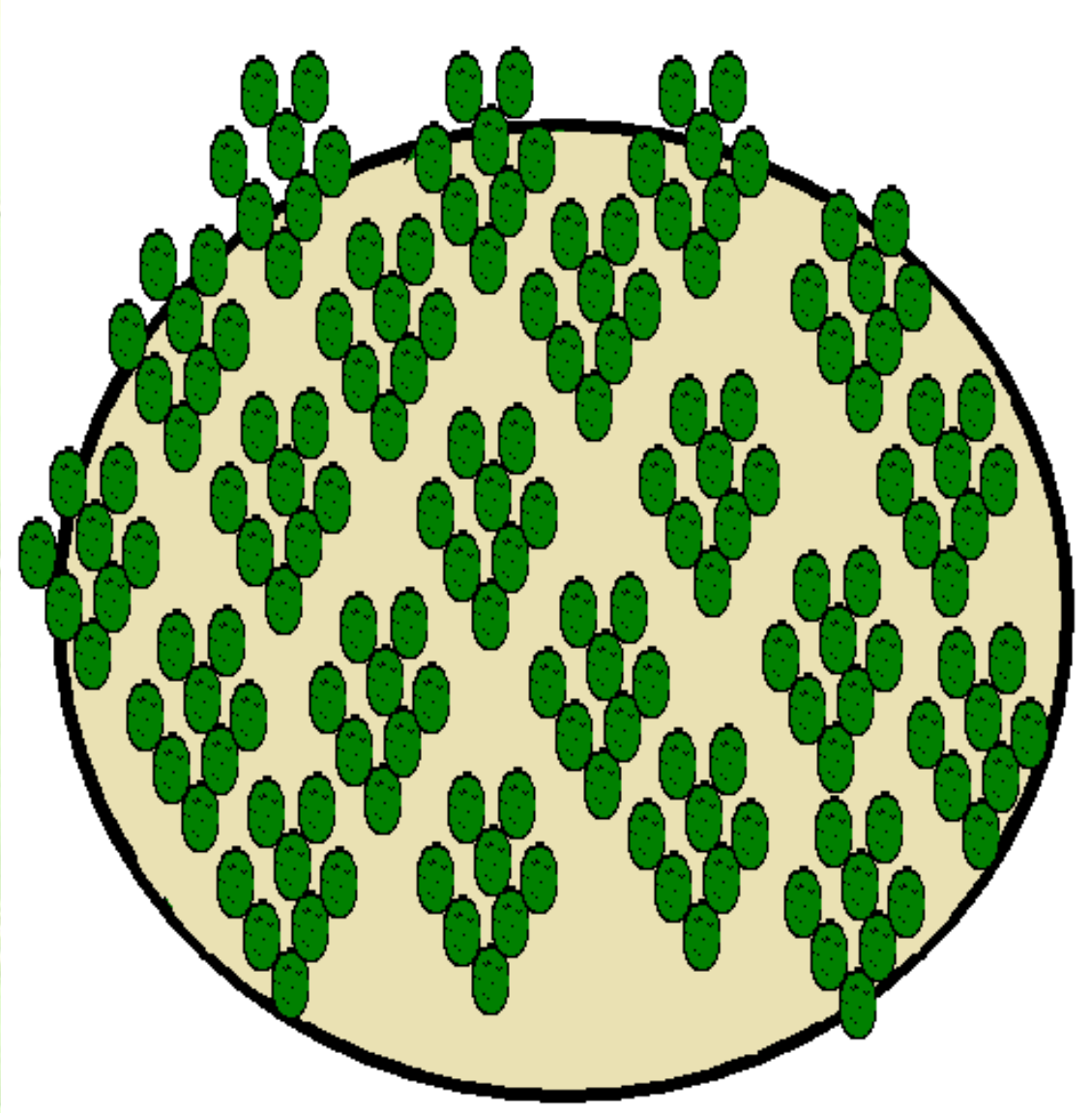
Basic design with Pots (21)



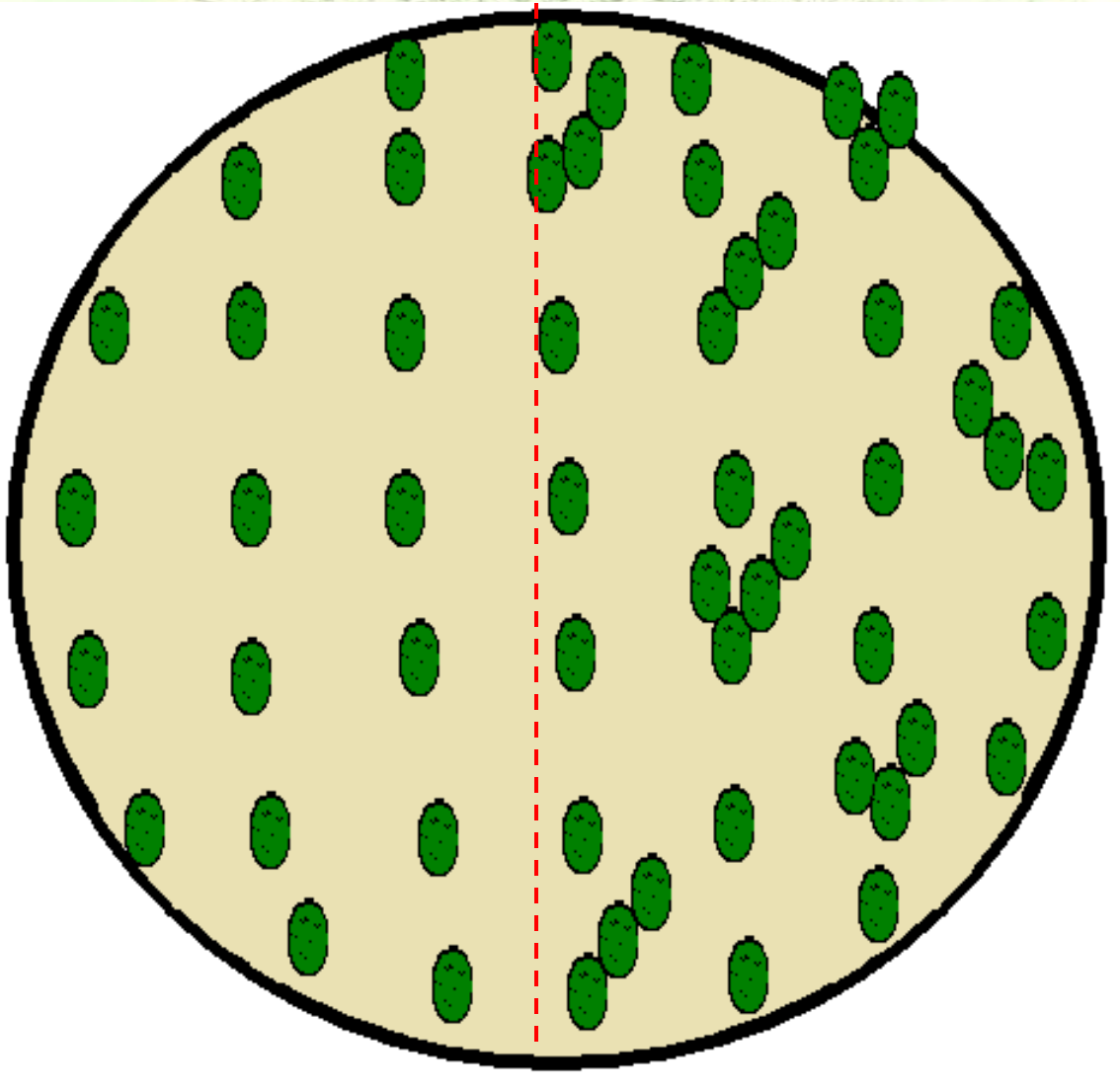
Basic design-no Pots (6)



Potted only 40 (2 sites)

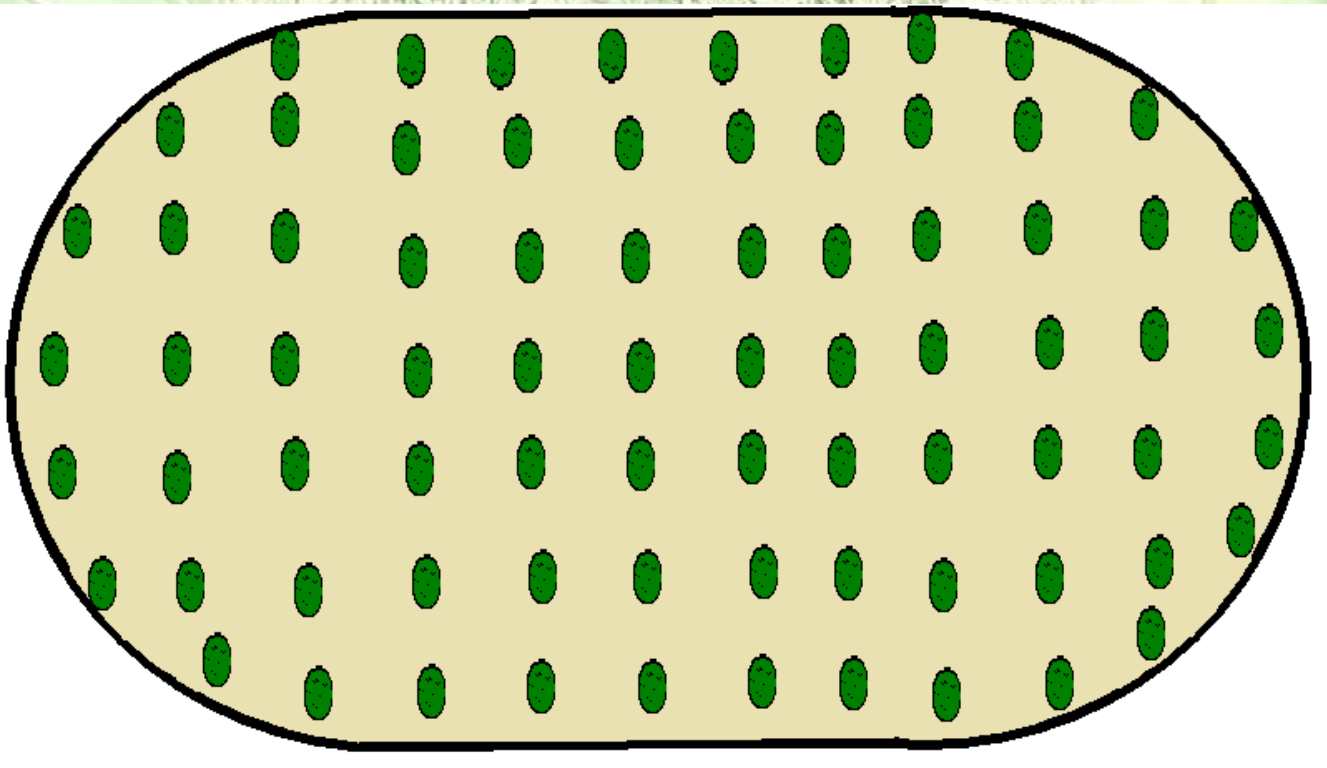


Half site double density (11)

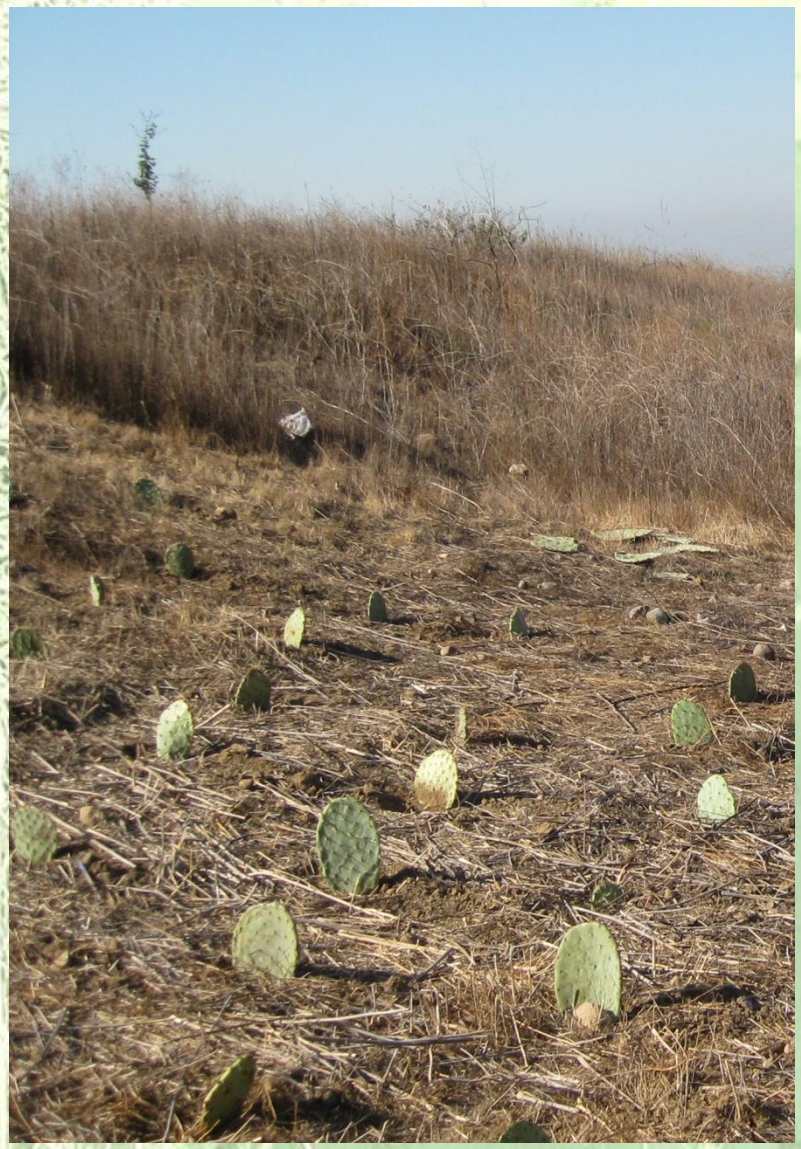


Double sites (4)
(included transplants)

~30 m



Cactus planting-Nov & Dec 2009



Branch and Potted Transplant Additions

Planting Potted Transplants

Planted Mega Site

Elderberry planting

- 2 trees/site
- 9 mo old transplant
- Tree tube

Maintenance

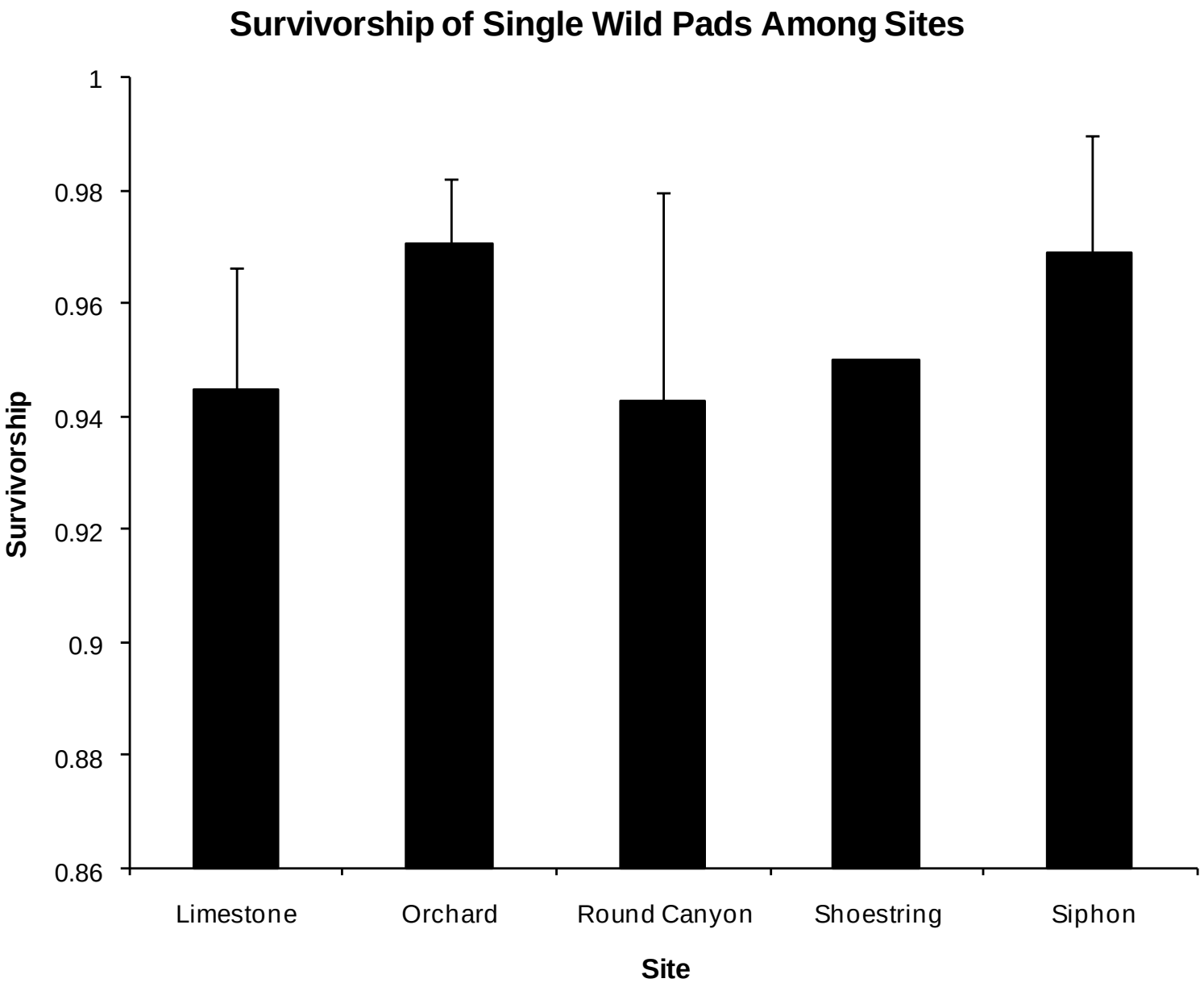
- 1-2 times per year based on weed growth
- late winter-early spring 2010, 2011

Round Canyon Feb 2010

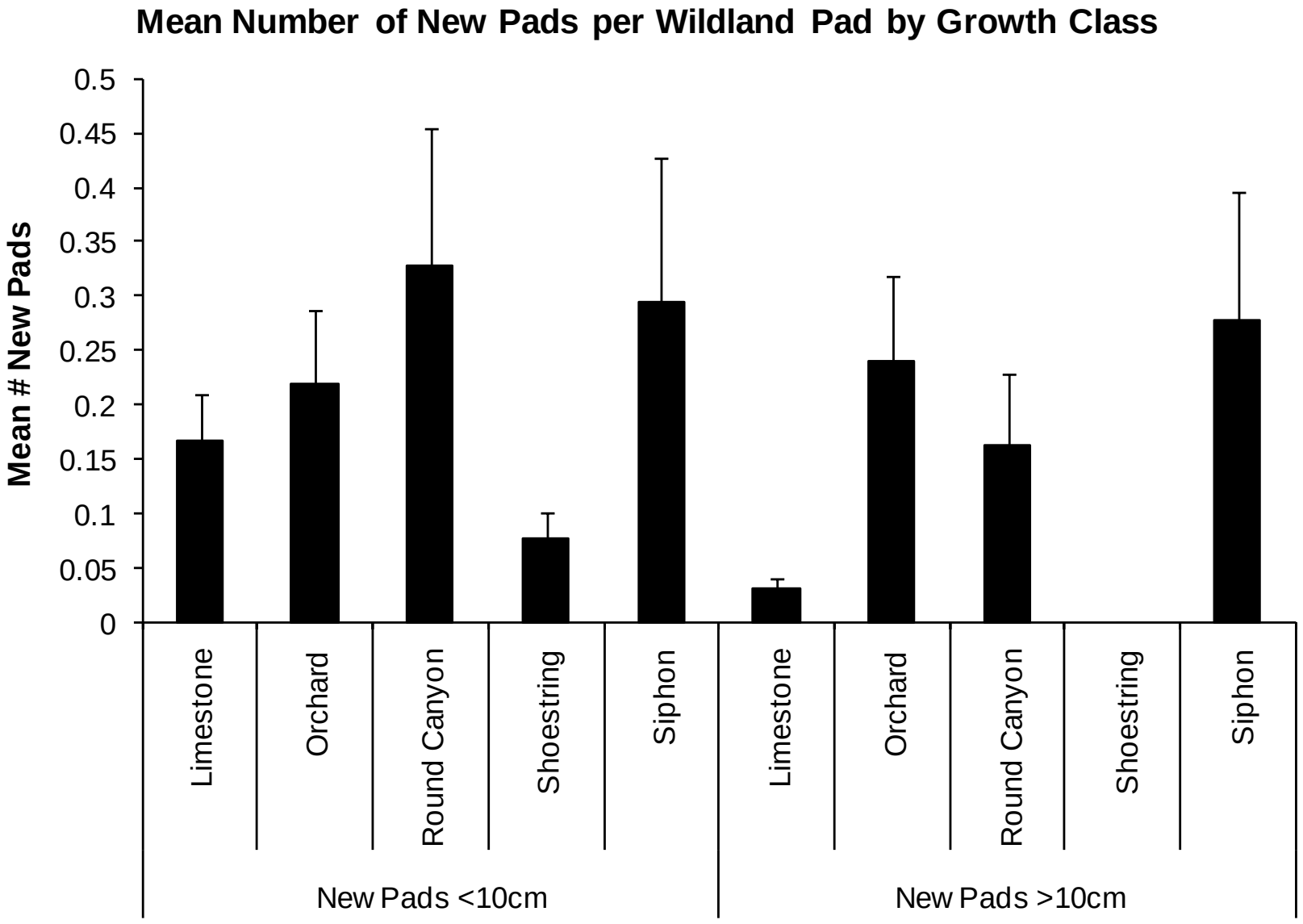
Monitoring

- **Short term:**
  - Survival, Growth (new joints per pad) and Health for each transplant type; May 2010

- **Long term (Years 2, 5, &10):**
  - plant cover (permanent, 25m point intercept transects); May 2011
  - Surveys for Cactus Wren territories at sites and in the vicinity; May 2011
  - Growth rate and site preferences by Cactus Wren across sites differing in size, planting density, and transplant types

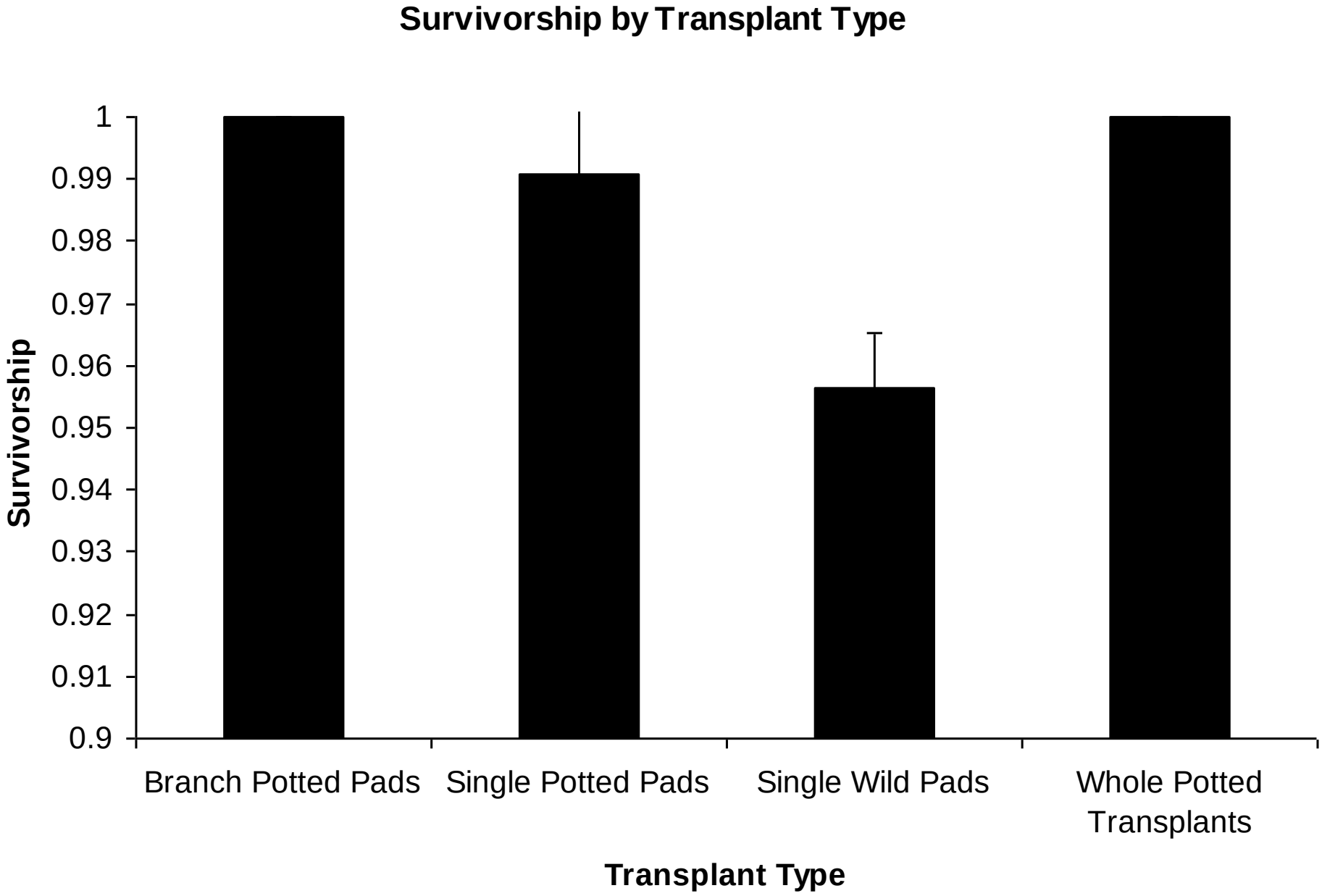


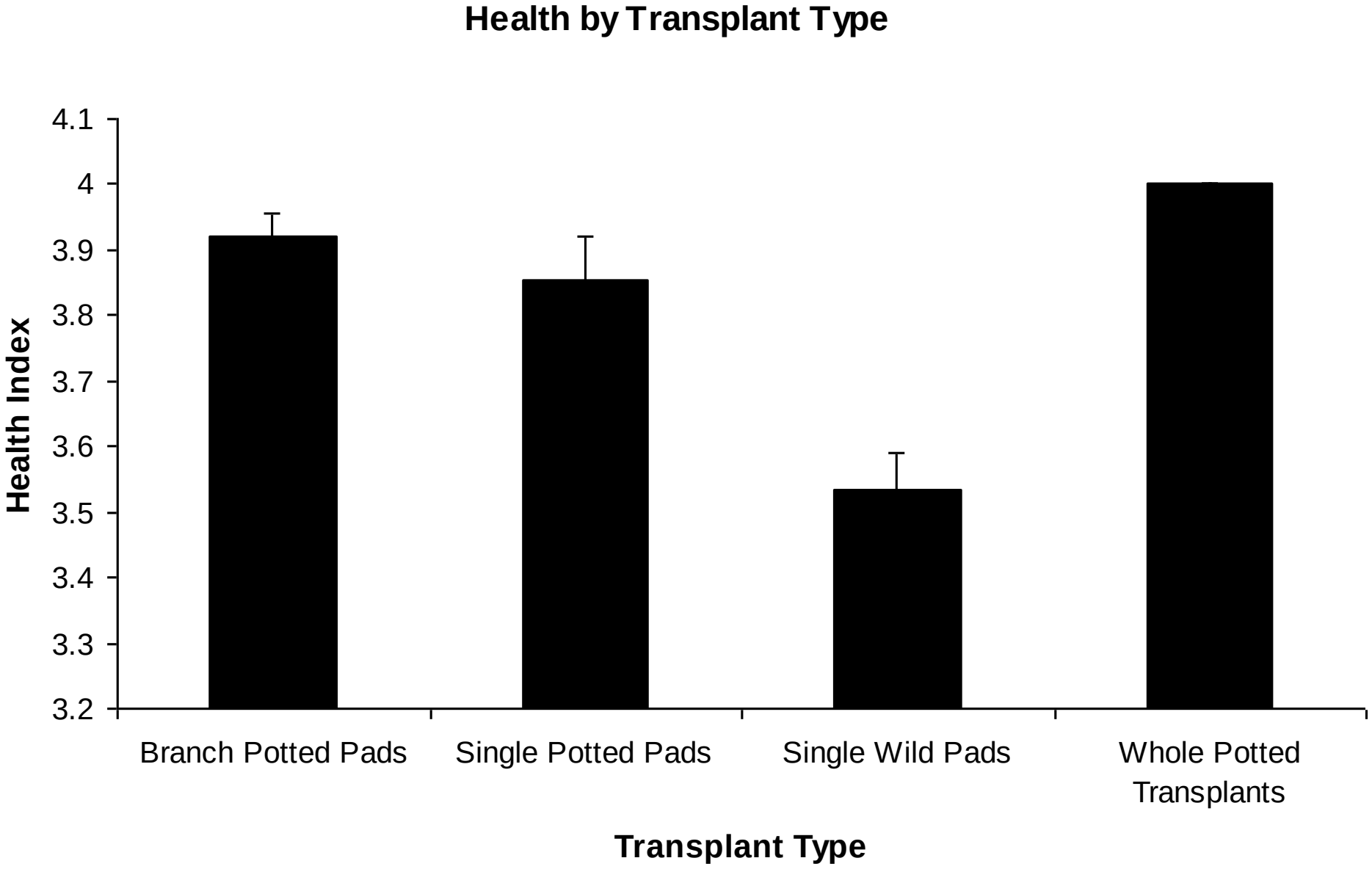
Based on 20 randomly selected individual pads



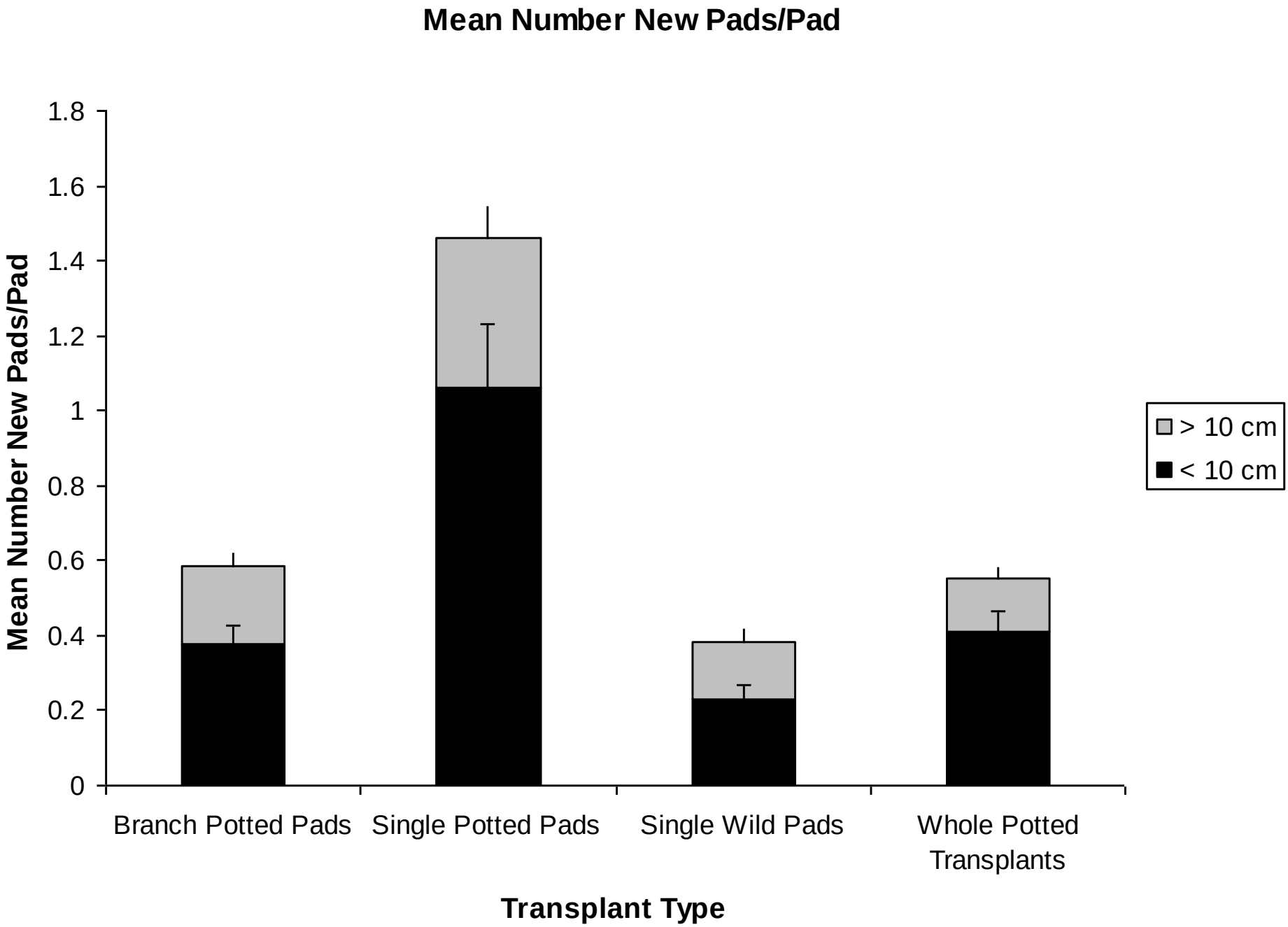
More variable across sites than survivorship (initial weed cover?)

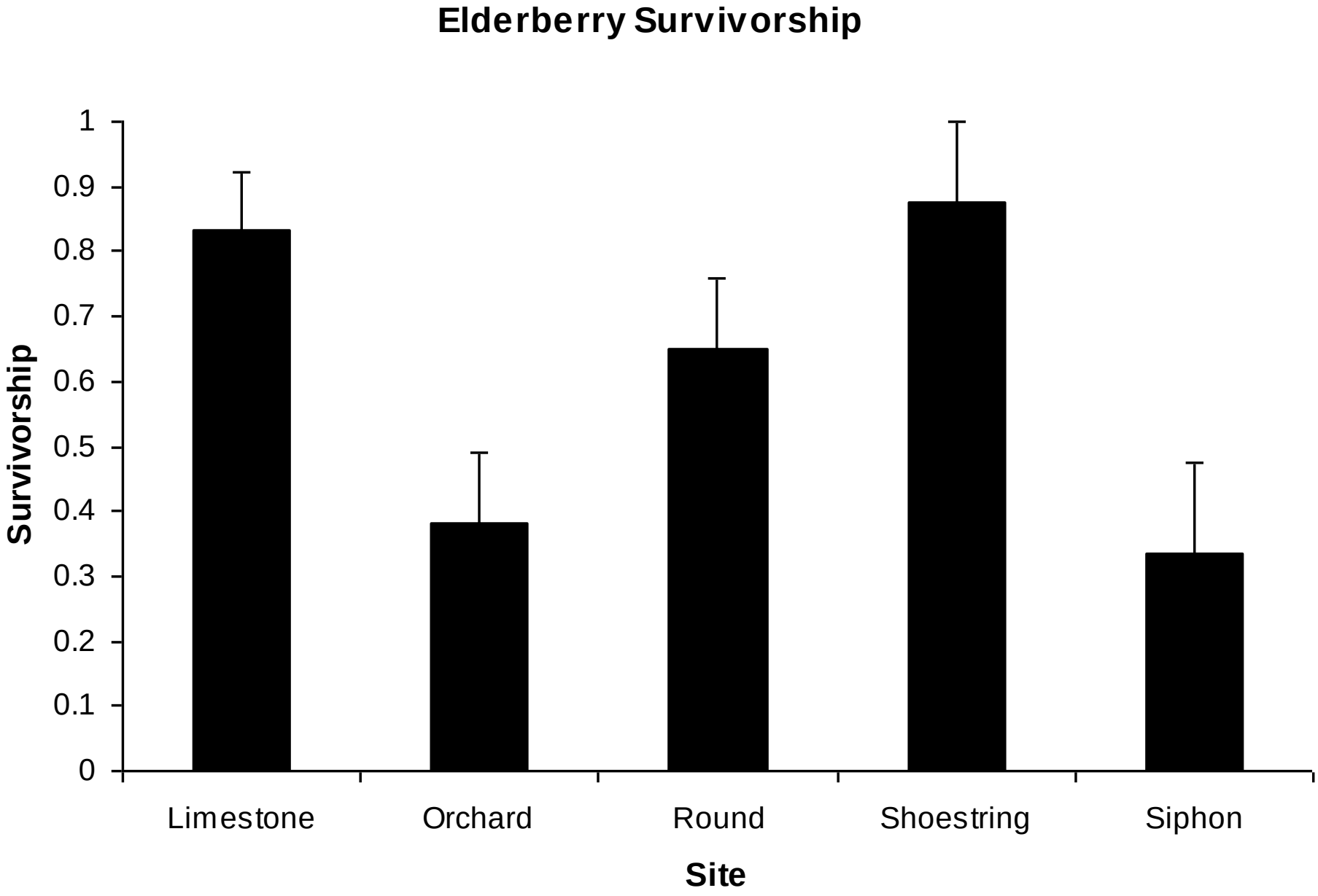

Siphon Apr 2011


Survivorship by Transplant Type
Survivorship
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
Branch Potted Pads
Single Potted Pads
Single Wild Pads
Whole Potted Transplants
Transplant Type

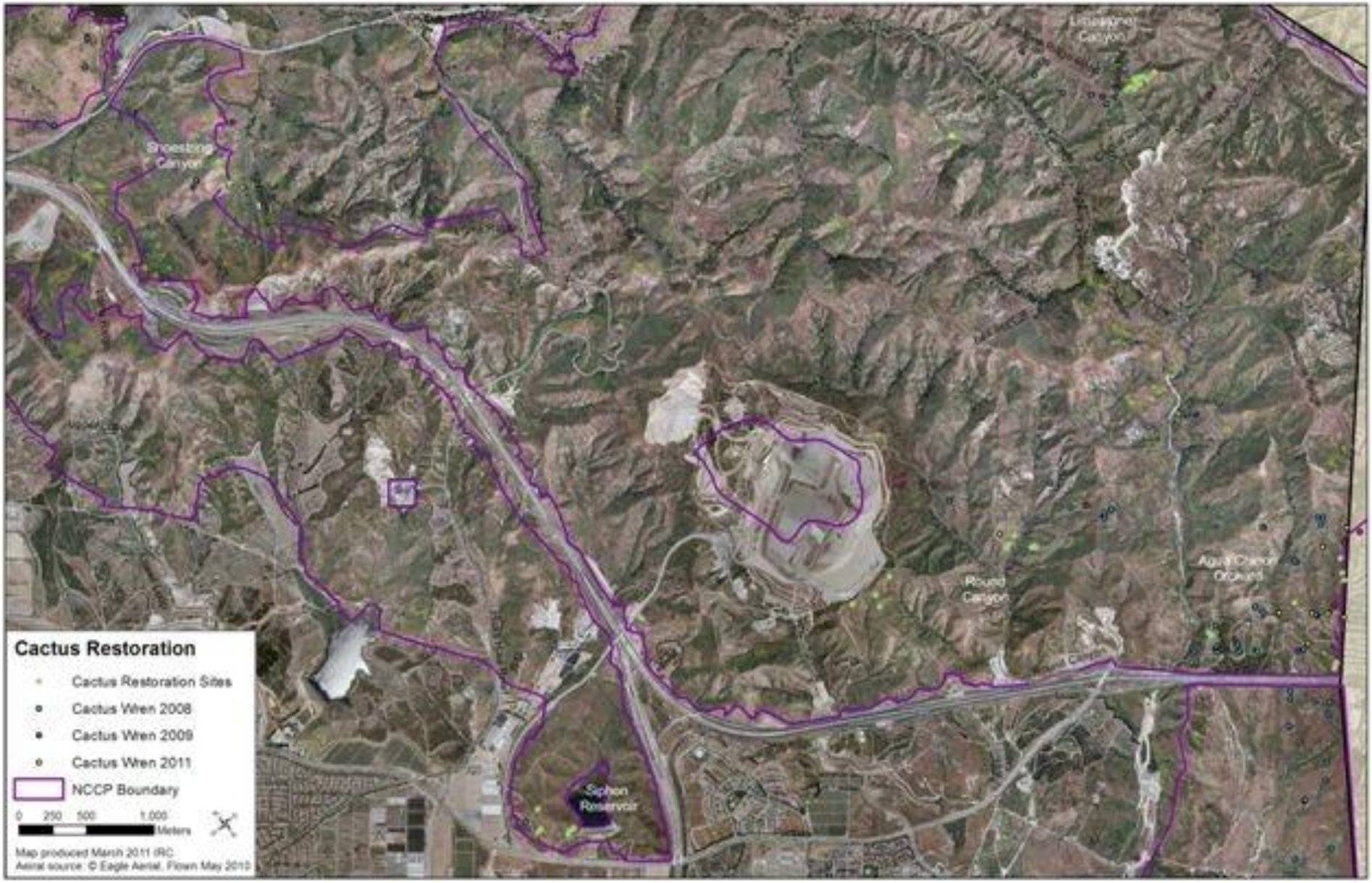


Health color scale majority pad; 0=brown, 1=yellow; 2=yellow & green; 3=green

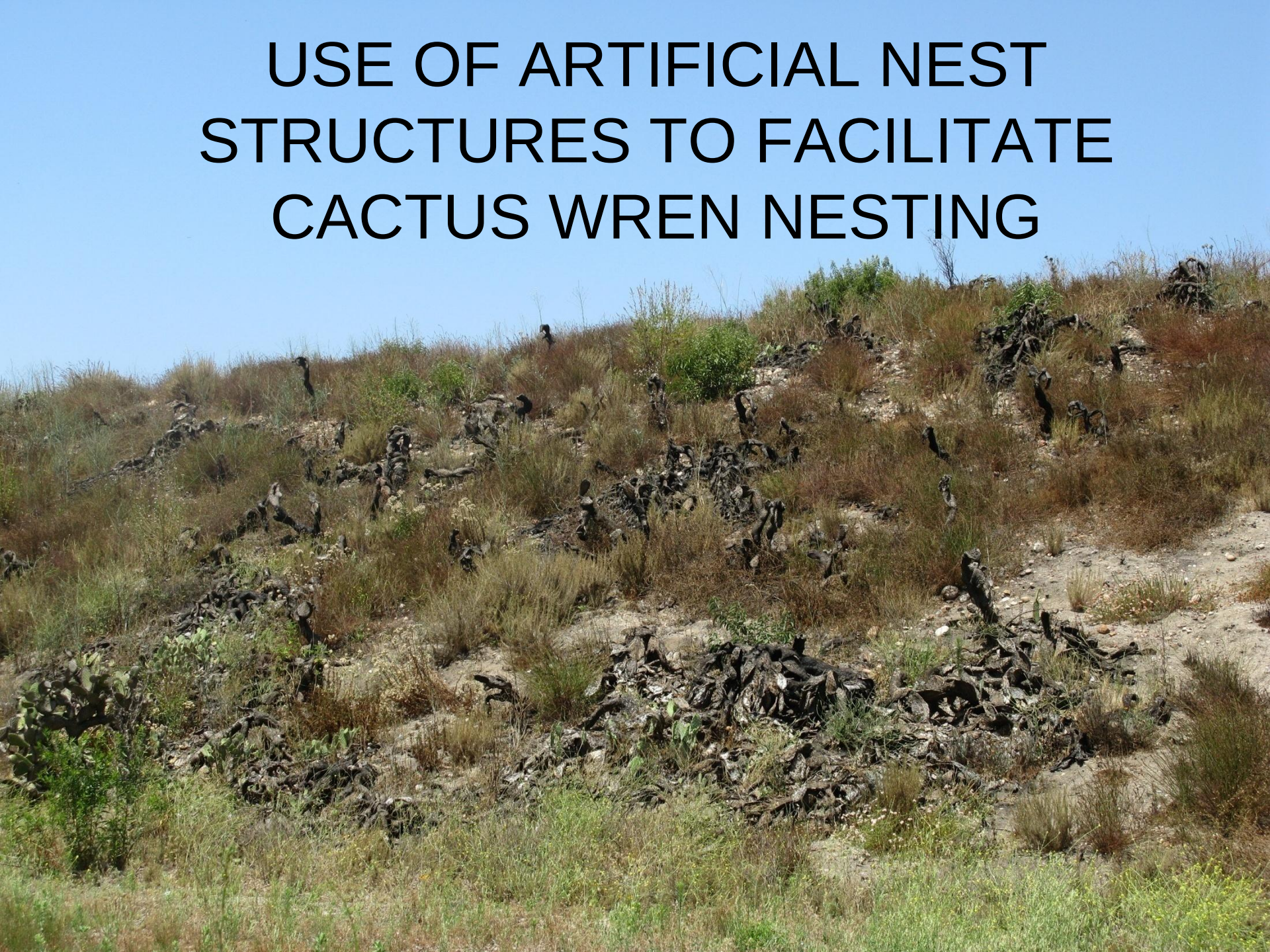

Mean Number New Pads/Pad
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Mean Number New Pads/Pad
> 10 cm
< 10 cm
Branch Potted Pads
Single Potted Pads
Single Wild Pads
Whole Potted Transplants
Transplant Type


Elderberry Survivorship
Survivorship
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Limestone
Orchard
Round
Shoestring
Siphon
Site

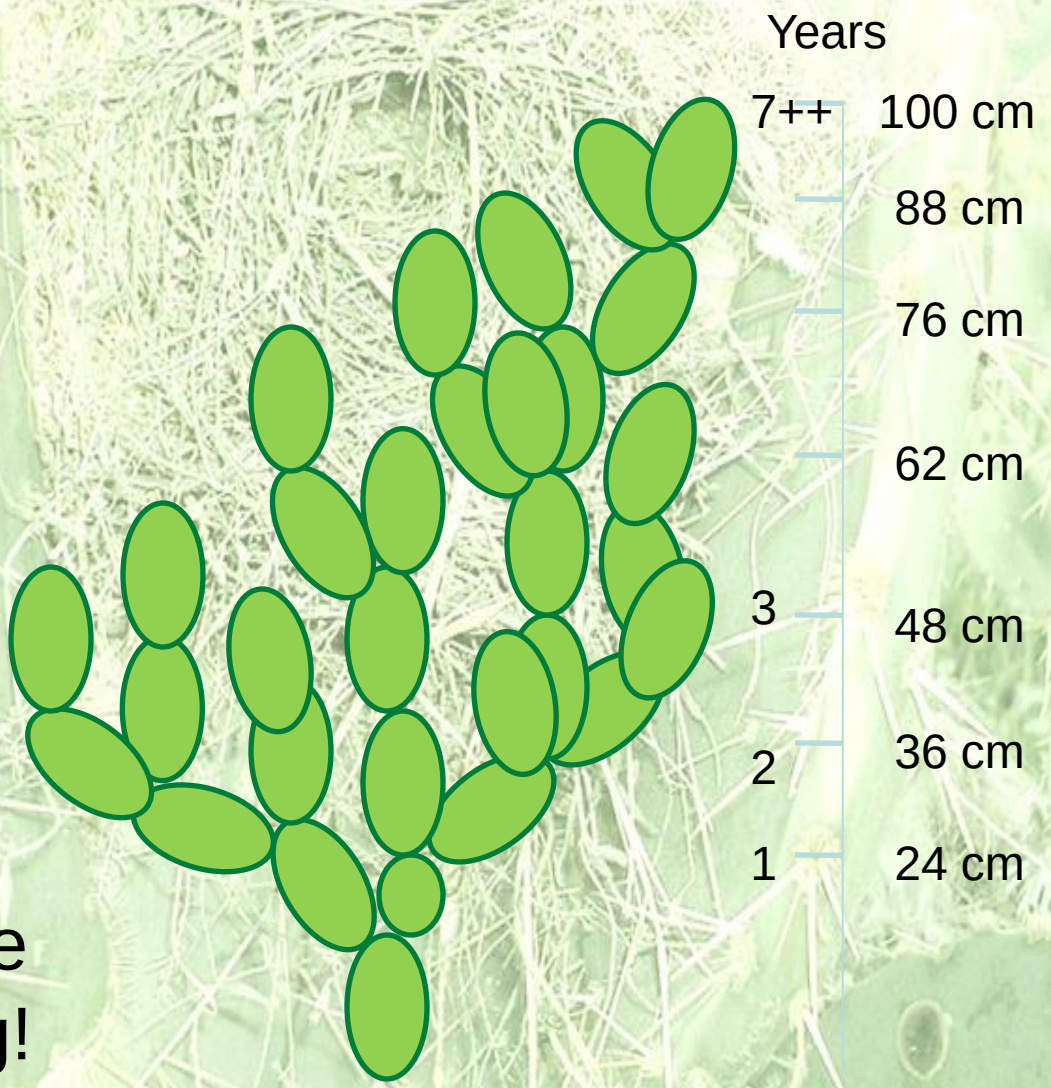
Cactus Wren Surveys in Vicinity of Restoration Patches
Spring 2009 & 2011



USE OF ARTIFICIAL NEST STRUCTURES TO FACILITATE CACTUS WREN NESTING



Hypothetical *minimal time* for planted cactus pads to reach nesting height:



Reality may be twice that long!

Justification

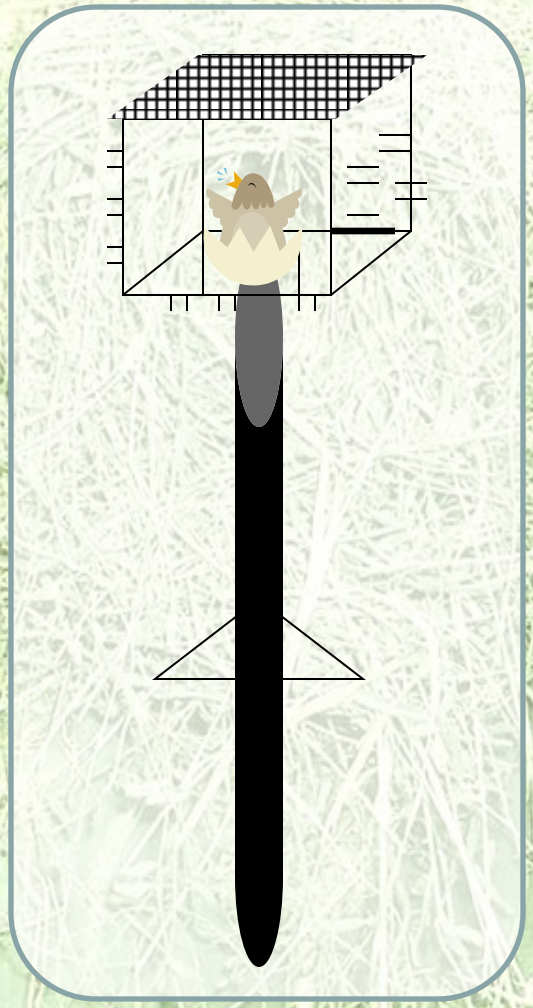
- Nest structures may encourage nesting in marginal cactus scrub where nest sites are limited
- Nest structures could provide nest sites at restorations / during post-fire recovery

ARTIFICIAL NEST STRUCTURES

- Installed 15 artificial structures in NCCP
- All min. 1.5m highin occupied habitat
- V-shaped structures inserted for nest support

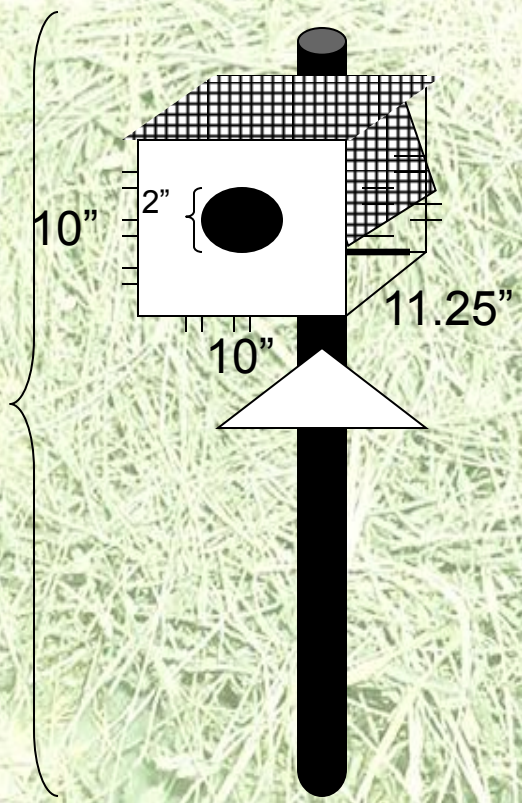
Perching, but no nesting…

ARTIFICIAL NEST STRUCTURES



8’

Two metal pipes screwed together



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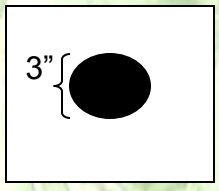

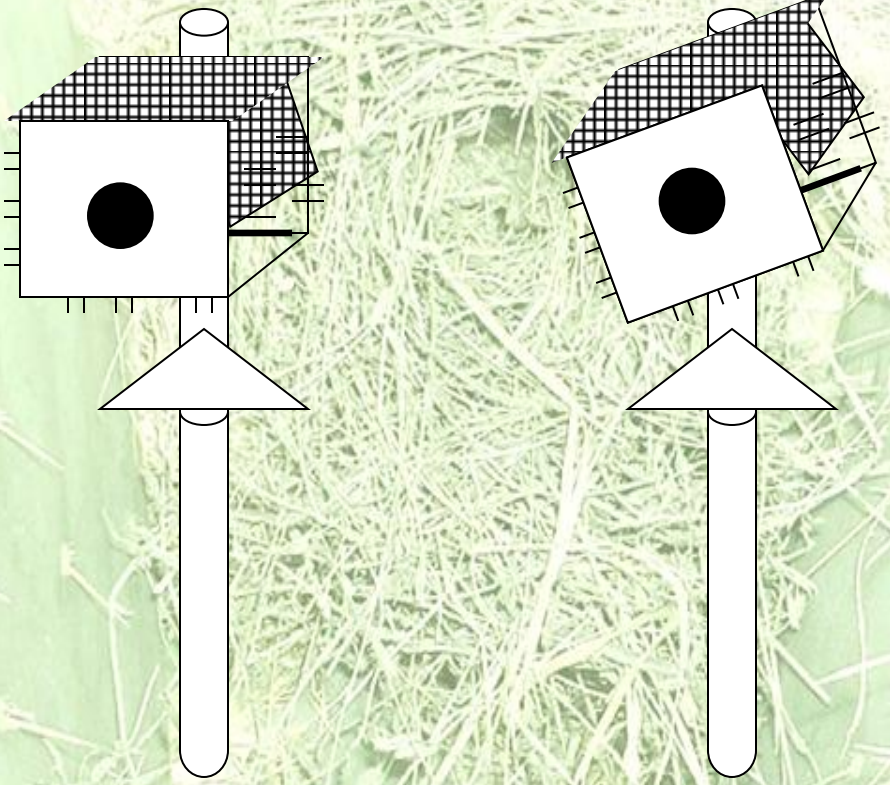

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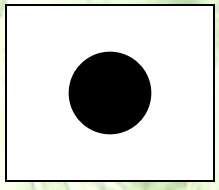
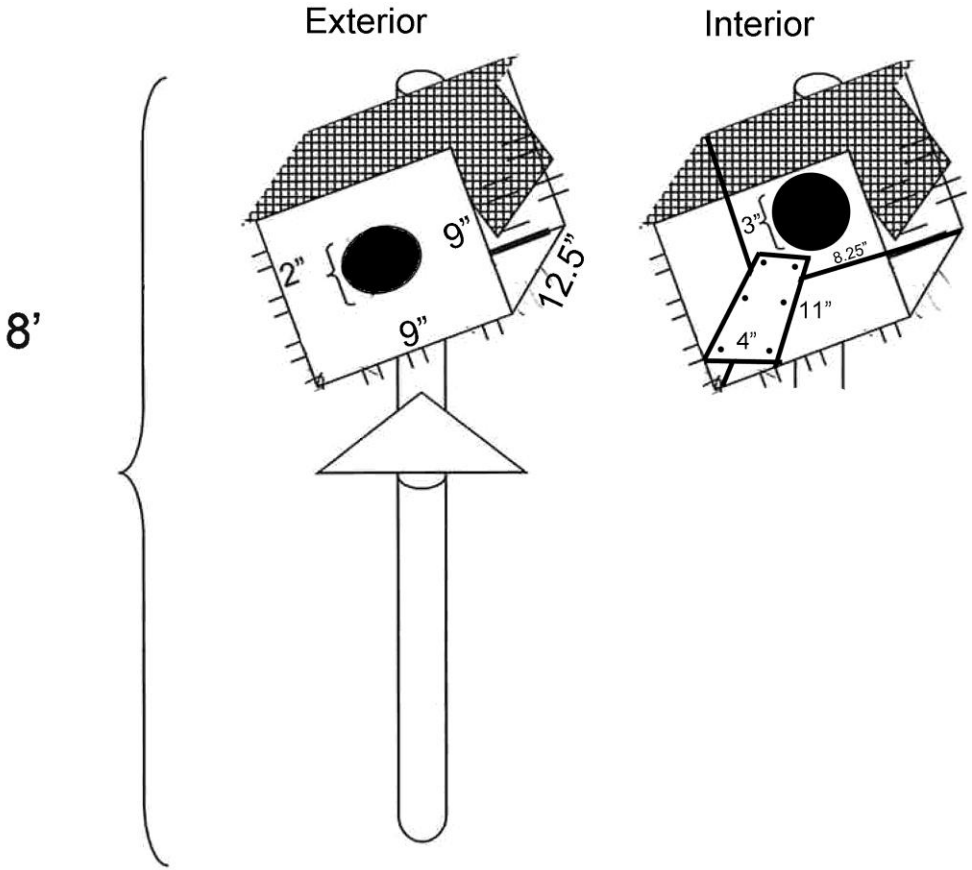



Photo: Robb Hamilton


Photo: Bobb Hamilton

NEXT STEPS…



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